تكوين Dynamic Multipoint VPN (DMVPN) باستخدام GRE عبر IPSec بين الموجهات المتعددة

المحتويات

المقدمة

تتيح ميزة Dynamic Multipoint VPN (DMVPN) للمستخدمين إمكانية تطوير شبكات VPN IPSec الكبيرة والصغيرة بشكل أفضل من خلال دمج أنفاق تضمين التوجيه العام (GRE) وتشفير IPSec وبروتوكول تحليل الخطوة التالية (NHRP) لتزويد المستخدمين بتكوين سهل من خلال ملفات تعريف التشفير، التي تتجاوز متطلبات تحديد خرائط التشفير الثابتة والاكتشاف الديناميكي لنقاط النهاية للنفق.

المتطلبات الأساسية

المتطلبات

لا توجد متطلبات خاصة لهذا المستند.

المكونات المستخدمة

تستند المعلومات الواردة في هذا المستند إلى إصدارات البرامج والمكونات المادية أدناه.

- الموجهات Cisco 2691 و 3725

- برنامج IOS® الإصدار 12.3(3) من Cisco

ملاحظة: يتم دعم العديد من منافذ IPSec فقط على برنامج Cisco IOS الإصدار 12.2.2(2)XK و 12.2.2(13)T والإصدارات الأحدث.

يتم عرض الإخراج من الأمر **show version** على الموجه أدناه:

```
sv9-4#show version
Cisco Internetwork Operating System Software
,(IOS (tm) 2600 Software (C2691-IK9S-M), Version 12.3(3
(RELEASE SOFTWARE (fc2
.Copyright (c) 1986-2003 by cisco Systems, Inc
Compiled Tue 19-Aug-03 05:52 by dchih
Image text-base: 0x60008954, data-base: 0x61D08000

,ROM: System Bootstrap, Version 12.2(8r)T2
(RELEASE SOFTWARE (fc1

sv9-4 uptime is 1 hour, 39 minutes
System returned to ROM by reload
"System image file is "flash:c2691-ik9s-mz.123-3.bin

This product contains cryptographic features and is subject
,to United States and local country laws governing import
export, transfer and use. Delivery of Cisco cryptographic
,products does not imply third-party authority to import
,export, distribute or use encryption. Importers, exporters
distributors and users are responsible for compliance with
U.S. and local country laws. By using this product you agree
to comply with applicable laws and regulations. If you are
unable to comply with U.S. and local laws, return this product
.immediately

A summary of U.S. laws governing Cisco cryptographic products
:may be found at
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending
.email to export@cisco.com

(cisco 2691 (R7000) processor (revision 0.1
.with 98304K/32768K bytes of memory
Processor board ID JMX0710L5CE
,R7000 CPU at 160Mhz, Implementation 39
Rev 3.3, 256KB L2 Cache
.Bridging software
.X.25 software, Version 3.0.0
.(SuperLAT software (copyright 1990 by Meridian Technology Corp
(FastEthernet/IEEE 802.3 interface(s 2
(Serial(sync/async) network interface(s 2
(ATM network interface(s 1
(Virtual Private Network (VPN) Module(s 1
.DRAM configuration is 64 bits wide with parity disabled
.55K bytes of non-volatile configuration memory
(125184K bytes of ATA System CompactFlash (Read/Write

Configuration register is 0x2102
```

تم إنشاء المعلومات المُقدمة في هذا المستند من الأجهزة الموجودة في بيئة معملية خاصة. بدأت جميع الأجهزة المُستخدمة في هذا المستند بتكوين ممسوح (افتراضي). إذا كنت تعمل في شبكة مباشرة، فتأكد من فهمك للتأثير المحتمل لأي أمر قبل استخدامه.

النظرية الأساسية

تعمل الميزة وفقا للقواعد التالية.

- يحتوي كل متحدث على نفق IPSec دائم للمحور، وليس للمعلمات الأخرى داخل الشبكة. قام كل واحد من المتكلمين بالتسجيل كعملاء لخادم NHRP.
- عندما يحتاج أحد المتكلمين إلى إرسال حزمة إلى شبكة فرعية (خاصة) لوجهة ما على شبكة أخرى تم التحدث بها، فإنه يستعلم خادم NHRP عن العنوان الحقيقي (الخارجي) للوجهة (الهدف) التي تم التحدث بها.
- بعد أن يتعرف المتحدث الأصلي على عنوان النظير الخاص بالهدف الذي تم التحدث عنه، يمكن أن يقوم ببدء نفق IPSec ديناميكي للوصول إلى الهدف الذي تم التحدث عنه.
- ويتم إنشاء النفق الذي يتحدث إلى المتحدثين عبر واجهة GRE متعددة النقاط (mGRE).
- وتنشأ الوصلات التي تتحدث عند الطلب كلما كان هناك زحام بين الفروع. بعد ذلك، يمكن للحزم تجاوز الصرة واستخدام النفق الذي يتحدث.

تنطبق التعريفات التالية على مجموعة القواعد.

- بروتوكول NHRP—A للخادم والعميل حيث يكون الموزع هو الخادم بينما تكون الفروع هي العملاء. يحتفظ الصرة بقاعدة بيانات NHRP لعناوين الواجهة العامة لكل كلمة. ويسجل كل خطاب عنوانه الحقيقي عندما يقوم بتحميل قاعدة بيانات NHRP والاستعلام عنها عن العناوين الحقيقية للأقسام الفرعية الوجهة من أجل بناء أنفاق مباشرة.
- واجهة نفق mGRE — تتيح واجهة GRE واحدة دعم العديد من أنفاق IPSec وتبسيط حجم التكوين وتعقيده.

ملاحظة: بعد وجود مقدار مكون مسبقا من عدم النشاط في الأنفاق التي يتم التحدث بها، سيقوم الموجه بتدمير هذه الأنفاق لتوفير الموارد (جمعيات أمان IPSec [SA]).

ملاحظة: يجب أن يتبع ملف تعريف حركة المرور القاعدة من 80 إلى 20 بالمائة: 80 بالمائة من حركة المرور تتكون من حركة مرور يتم الاتصال بها، و 20 بالمائة من حركة المرور تتكون من حركة مرور تتحدث إلى.

الاصطلاحات

راجع اصطلاحات تلميحات Cisco التقنية للحصول على مزيد من المعلومات حول اصطلاحات المستندات.

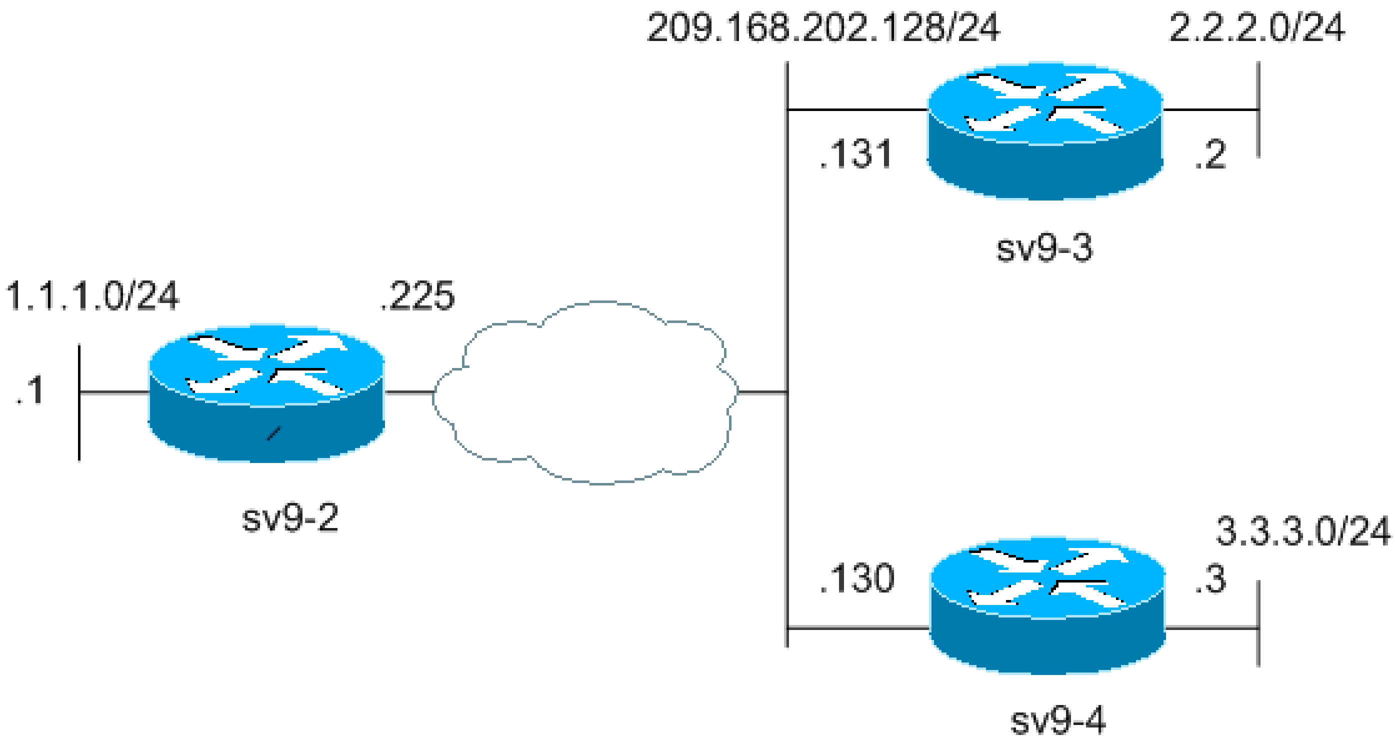
التكوين

في هذا القسم، تُقدّم لك معلومات تكوين الميزات الموضحة في هذا المستند.

ملاحظة: للعثور على معلومات إضافية حول الأوامر المستخدمة في هذا المستند، أستخدم أداة بحث الأوامر (للعملاء المسجلين فقط).

الرسم التخطيطي للشبكة

يستخدم هذا المستند إعداد الشبكة الموضح في الرسم التخطيطي أدناه.



التكوينات

يستخدم هذا المستند التكوينات الموضحة أدناه.

- تكوين موجه الموزع (SV9-2)
- تم الحديث رقم 1 (SV9-3) التكوين
- تم الحديث رقم 2 (SV9-4) التكوين

تكوين موجه الموزع (SV9-2)

```
sv9-2#show run
...Building configuration

Current configuration : 1827 bytes
!
version 12.3
service config
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname sv9-2
!
boot-start-marker
boot-end-marker
!
enable password cisco
!
no aaa new-model
ip subnet-zero
!
!
no ip domain lookup
!
ip ssh break-string
```

```
!
Create an Internet Security Association and Key ---!
Management !--- Protocol (ISAKMP) policy for Phase 1
negotiations. ! crypto isakmp policy 10
hash md5
authentication pre-share
Add dynamic pre-shared keys for all the remote VPN ---!
!--- routers. crypto isakmp key cisco123 address 0.0.0.0
0.0.0.0
!
Create the Phase 2 policy for actual data ---!
encryption. crypto ipsec transform-set strong esp-3des
esp-md5-hmac
!
Create an IPSec profile to be applied dynamically ---!
to the !--- GRE over IPSec tunnels. crypto ipsec profile
cisco
set security-association lifetime seconds 120
set transform-set strong
!
!
!
!
!
!
!
!
!
!
!
no voice hpi capture buffer
no voice hpi capture destination
!
!
!
!
!
!
!
Create a GRE tunnel template which will be applied ---!
to !--- all the dynamically created GRE tunnels.
interface Tunnel0
ip address 192.168.1.1 255.255.255.0
no ip redirects
ip mtu 1440
ip nhrp authentication cisco123
ip nhrp map multicast dynamic
ip nhrp network-id 1
no ip split-horizon eigrp 90
no ip next-hop-self eigrp 90
tunnel source FastEthernet0/0
tunnel mode gre multipoint
tunnel key 0
tunnel protection ipsec profile cisco
!
This is the outbound interface. interface ---!
FastEthernet0/0 ip address 209.168.202.225 255.255.255.0
duplex auto speed auto ! !--- This is the inbound
interface. interface FastEthernet0/1 ip address 1.1.1.1
255.255.255.0 duplex auto speed auto ! interface BRI1/0
no ip address shutdown ! interface BRI1/1 no ip address
shutdown ! interface BRI1/2 no ip address shutdown !
interface BRI1/3 no ip address shutdown ! !--- Enable a
routing protocol to send and receive !--- dynamic
```

```
updates about the private networks. router eigrp 90
network 1.1.1.0 0.0.0.255
network 192.168.1.0
no auto-summary
!
ip http server
no ip http secure-server
ip classless
ip route 0.0.0.0 0.0.0.0 209.168.202.226
!
!
!
!
!
!
!
!
!
!
!
line con 0
exec-timeout 0 0
transport preferred all
transport output all
escape-character 27
line aux 0
transport preferred all
transport output all
line vty 0 4
password cisco
login
transport preferred all
transport input all
transport output all
!
!
end
```

تم الحديث رقم 1 (SV9-3) التكوين

```
sv9-3#show run
...Building configuration

Current configuration : 1993 bytes
!
version 12.3
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname sv9-3
!
boot-start-marker
boot system flash:c3725-ik9s-mz.123-3.bin
boot-end-marker
!
!
no aaa new-model
ip subnet-zero
!
!
no ip domain lookup
!
```

```
ip ssh break-string
!
!
Create an ISAKMP policy for Phase 1 negotiations. ---!
crypto isakmp policy 10
hash md5
authentication pre-share
Add dynamic pre-shared keys for all the remote VPN ---!
!--- routers and the hub router. crypto isakmp key
cisco123 address 0.0.0.0 0.0.0.0
!
!
Create the Phase 2 policy for actual data ---!
encryption. crypto ipsec transform-set strong esp-3des
esp-md5-hmac
!
Create an IPSec profile to be applied dynamically ---!
to !--- the GRE over IPSec tunnels. crypto ipsec profile
cisco
set security-association lifetime seconds 120
set transform-set strong
!
!
!
!
!
!
!
!
!
!
!
no voice hpi capture buffer
no voice hpi capture destination
!
!
fax interface-type fax-mail
!
!
!
!
!
Create a GRE tunnel template to be applied to !--- ---!
all the dynamically created GRE tunnels. interface
Tunnel0
ip address 192.168.1.2 255.255.255.0
no ip redirects
ip mtu 1440
ip nhrp authentication cisco123
ip nhrp map multicast dynamic
ip nhrp map 192.168.1.1 209.168.202.225
ip nhrp map multicast 209.168.202.225
ip nhrp network-id 1
ip nhrp nhs 192.168.1.1
tunnel source FastEthernet0/0
tunnel mode gre multipoint
tunnel key 0
tunnel protection ipsec profile cisco
!
This is the outbound interface. interface ---!
FastEthernet0/0 ip address 209.168.202.131 255.255.255.0
duplex auto speed auto ! !--- This is the inbound
interface. interface FastEthernet0/1 ip address 2.2.2.2
255.255.255.0 duplex auto speed auto ! interface BRI1/0
```

```
no ip address shutdown ! interface BRI1/1 no ip address
shutdown ! interface BRI1/2 no ip address shutdown !
interface BRI1/3 no ip address shutdown ! !--- Enable a
routing protocol to send and receive !--- dynamic
updates about the private networks. router eigrp 90
network 2.2.2.0 0.0.0.255
network 192.168.1.0
no auto-summary
!
ip http server
no ip http secure-server
ip classless
ip route 0.0.0.0 0.0.0.0 209.168.202.225
ip route 3.3.3.0 255.255.255.0 Tunnel0
!
!
!
!
!
!
!
!
dial-peer cor custom
!
!
!
!
!
line con 0
exec-timeout 0 0
transport preferred all
transport output all
escape-character 27
line aux 0
transport preferred all
transport output all
line vty 0 4
login
transport preferred all
transport input all
transport output all
!
!
end
```

تم الحديث رقم 2 (SV9-4) التكوين

```
sv9-4#show run
...Building configuration

Current configuration : 1994 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname sv9-4
!
boot-start-marker
boot system flash:c2691-ik9s-mz.123-3.bin
boot-end-marker
!
```

```
!
no aaa new-model
ip subnet-zero
!
!
no ip domain lookup
!
ip ssh break-string
!
!
!
Create an ISAKMP policy for Phase 1 negotiations. ---!
crypto isakmp policy 10
hash md5
authentication pre-share
Add dynamic pre-shared keys for all the remote VPN ---!
!--- routers and the hub router. crypto isakmp key
cisco123 address 0.0.0.0 0.0.0.0
!
!
Create the Phase 2 policy for actual data ---!
encryption. crypto ipsec transform-set strong esp-3des
esp-md5-hmac
!
Create an IPSec profile to be applied dynamically ---!
to !--- the GRE over IPSec tunnels. crypto ipsec profile
cisco
set security-association lifetime seconds 120
set transform-set strong
!
!
!
!
!
!
!
!
!
!
!
no voice hpi capture buffer
no voice hpi capture destination
!
!
!
!
!
!
!
Create a GRE tunnel template to be applied to !--- ---!
all the dynamically created GRE tunnels. interface
Tunnel0
ip address 192.168.1.3 255.255.255.0
no ip redirects
ip mtu 1440
ip nhrp authentication cisco123
ip nhrp map multicast dynamic
ip nhrp map 192.168.1.1 209.168.202.225
ip nhrp map multicast 209.168.202.225
ip nhrp network-id 1
ip nhrp nhs 192.168.1.1
tunnel source FastEthernet0/0
tunnel mode gre multipoint
tunnel key 0
tunnel protection ipsec profile cisco
!
This is the outbound interface. interface ---!
FastEthernet0/0 ip address 209.168.202.130 255.255.255.0
duplex auto speed auto ! interface Serial0/0 no ip
address shutdown clockrate 2000000 no fair-queue ! !---
This is the inbound interface. interface FastEthernet0/1
ip address 3.3.3.3 255.255.255.0 duplex auto speed auto
! interface Serial0/1 no ip address shutdown clockrate
2000000 ! interface ATM1/0 no ip address shutdown no atm
ilmi-keepalive ! !--- Enable a routing protocol to send
and receive !--- dynamic updates about the private
networks. router eigrp 90
network 3.3.3.0 0.0.0.255
network 192.168.1.0
no auto-summary
!
ip http server
no ip http secure-server
ip classless
ip route 2.2.2.0 255.255.255.0 Tunnel0
ip route 0.0.0.0 0.0.0.0 209.168.202.225
!
!
!
!
!
!
!
!
dial-peer cor custom
!
!
!
!
!
line con 0
exec-timeout 0 0
transport preferred all
transport output all
escape-character 27
line aux 0
transport preferred all
transport output all
line vty 0 4
password cisco
login
transport preferred all
transport input all
transport output all
!
!
end
```

التحقق من الصحة

يوفر هذا القسم معلومات يمكنك إستخدامها للتأكد من أن التكوين يعمل بشكل صحيح.

يتم دعم بعض أوامر **العرض بواسطة** أداة مترجم الإخراج (العملاء المسجلون فقط)، والتي تتيح لك عرض تحليل إخراج أمر **العرض**.

- **show crypto engine connection active**—يعرض إجمالي التشفيرات وفك التشفير لكل SA.
- **show crypto ipSec**—يعرض الإحصائيات على الأنفاق النشطة.
- **show crypto isakmp sa** —يعرض حالة ISAKMP SA.

استكشاف الأخطاء وإصلاحها

يوفر هذا القسم معلومات يمكنك استخدامها لاستكشاف أخطاء التكوين وإصلاحها.

يرفرف نفق DMVPN بشكل متقطع

المشكلة

يرفرف نفق DMVPN بشكل متقطع.

الحل

عند رفرفة أنفاق DMVPN، تحقق من الجوار بين الموجهات حيث قد تتسبب المشاكل المتعلقة بتكوين الجوار بين الموجهات في رفرفة نفق DMVPN. لحل هذه المشكلة، تأكد من أن المنطقة المجاورة بين الموجهات قيد التشغيل دائما.

أوامر استكشاف الأخطاء وإصلاحها

ملاحظة: قبل إصدار أوامر **تصحيح الأخطاء**، يرجى الاطلاع على المعلومات المهمة في أوامر تصحيح الأخطاء.

- **debug crypto ipSec**—يعرض أحداث IPSec.
- **debug crypto isakmp**—يعرض رسائل حول أحداث Internet Key Exchange (IKE).
- **debug crypto engine**—يعرض معلومات من محرك التشفير.

يمكن العثور على معلومات إضافية حول أستكشاف أخطاء IPSec وإصلاحها في أستكشاف أخطاء أمان IP وإصلاحها - فهم أوامر تصحيح الأخطاء واستخدامها.

إخراج تصحيح الأخطاء للعينة

- تصحيح أخطاء NHRP
- تصحيح أخطاء مفاوضات ISAKMP و IPSec

تصحيح أخطاء NHRP

يعرض إخراج تصحيح الأخطاء التالي طلب NHRP واستجابة تحليل NHRP. تم التقاط تصحيح الأخطاء من المحورين sv9-4 و sv9-3 و sv9-2 hub.

```
sv9-4#show debug
:NHRP
NHRP protocol debugging is on

sv9-4#ping 2.2.2.2

.Type escape sequence to abort
:Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds
!!!!!
```

```
     Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms
                                                                   sv9-4#
  Mar 1 02:06:01.667: NHRP: Sending packet to NHS 192.168.1.1 on Tunnel0*
  Mar 1 02:06:01.671: NHRP: Sending packet to NHS 192.168.1.1 on Tunnel0*
  Mar 1 02:06:01.675: NHRP: Sending packet to NHS 192.168.1.1 on Tunnel0*
                      .Mar 1 02:06:01.679: NHRP: Encapsulation succeeded*
                                        Tunnel IP addr 209.168.202.225
          ,Mar 1 02:06:01.679: NHRP: Send Resolution Request via Tunnel0*
                                                       packet size: 84
                  Mar 1 02:06:01.679: src: 192.168.1.3, dst: 192.168.1.1*
                          Mar 1 02:06:01.679: NHRP: 84 bytes out Tunnel0*
  Mar 1 02:06:01.679: NHRP: Sending packet to NHS 192.168.1.1 on Tunnel0*
  Mar 1 02:06:01.683: NHRP: Sending packet to NHS 192.168.1.1 on Tunnel0*
                      .Mar 1 02:06:03.507: NHRP: Encapsulation succeeded*
                                        Tunnel IP addr 209.168.202.225
          ,Mar 1 02:06:03.507: NHRP: Send Resolution Request via Tunnel0*
                                                       packet size: 84
                  Mar 1 02:06:03.507: src: 192.168.1.3, dst: 192.168.1.1*
                          Mar 1 02:06:03.507: NHRP: 84 bytes out Tunnel0*
         ,Mar 1 02:06:03.511: NHRP: Receive Resolution Reply via Tunnel0*
                                                      packet size: 132
                       Mar 1 02:06:03.511: NHRP: netid_in = 0, to_us = 1*
     Mar 1 02:06:03.511: NHRP: No need to delay processing of resolution*
               event nbma src:209.168.202.130 nbma dst:209.168.202.131

                                                                   sv9-3#
             NHRP: Sending packet to NHS 192.168.1.1 on Tunnel0 :05:31:12
             NHRP: Sending packet to NHS 192.168.1.1 on Tunnel0 :05:31:12
             NHRP: Sending packet to NHS 192.168.1.1 on Tunnel0 :05:31:12
  NHRP: Encapsulation succeeded. Tunnel IP addr 209.168.202.225 :05:31:12
     NHRP: Send Resolution Request via Tunnel0, packet size: 84 :05:31:12
                             src: 192.168.1.2, dst: 192.168.1.1 :05:31:12
                                     NHRP: 84 bytes out Tunnel0 :05:31:12
             NHRP: Sending packet to NHS 192.168.1.1 on Tunnel0 :05:31:12
 NHRP: Receive Resolution Request via Tunnel0, packet size: 104 :05:31:12
                                  NHRP: netid_in = 1, to_us = 0 :05:31:12
     NHRP: Delaying resolution request nbma src:209.168.202.131 :05:31:12
.nbma dst:209.168.202.130 reason:IPSEC-IFC: need to wait for IPsec SAs
   NHRP: Receive Resolution Reply via Tunnel0, packet size: 112 :05:31:12
                                  NHRP: netid_in = 0, to_us = 1 :05:31:12
 .(NHRP: Resolution request is already being processed (delayed :05:31:12
                           .NHRP: Resolution Request not queued :05:31:12
                                    .(Already being processed (delayed
             NHRP: Sending packet to NHS 192.168.1.1 on Tunnel0 :05:31:12
       NHRP: Process delayed resolution request src:192.168.1.3 :05:31:13
                                                           dst:2.2.2.2
          NHRP: No need to delay processing of resolution event :05:31:13
                     nbma src:209.168.202.131 nbma dst:209.168.202.130

                                                                   sv9-2#
          Mar 1 06:03:40.174: NHRP: Forwarding packet within same fabric*
                                                    Tunnel0 -> Tunnel0
          Mar 1 06:03:40.174: NHRP: Forwarding packet within same fabric*
                                                    Tunnel0 -> Tunnel0
          Mar 1 06:03:40.178: NHRP: Forwarding packet within same fabric*
                                                    Tunnel0 -> Tunnel0
       ,Mar 1 06:03:40.182: NHRP: Receive Resolution Request via Tunnel0*
                                                       packet size: 84
                       Mar 1 06:03:40.182: NHRP: netid_in = 1, to_us = 0*
     Mar 1 06:03:40.182: NHRP: No need to delay processing of resolution*
               event nbma src:209.168.202.225 nbma dst:209.168.202.130
                 Mar 1 06:03:40.182: NHRP: nhrp_rtlookup yielded Tunnel0*
                       Mar 1 06:03:40.182: NHRP: netid_out 1, netid_in 1*
           Mar 1 06:03:40.182: NHRP: nhrp_cache_lookup_comp returned 0x0*
Mar 1 06:03:40.182: NHRP: calling nhrp_forward*
.Mar 1 06:03:40.182: NHRP: Encapsulation succeeded*
   Tunnel IP addr 209.168.202.131
,Mar 1 06:03:40.182: NHRP: Forwarding Resolution Request via Tunnel0*
   packet size: 104
Mar 1 06:03:40.182: src: 192.168.1.1, dst: 2.2.2.2*
Mar 1 06:03:40.182: NHRP: 104 bytes out Tunnel0*
Mar 1 06:03:40.182: NHRP: Forwarding packet within same fabric*
   Tunnel0 -> Tunnel0
,Mar 1 06:03:40.182: NHRP: Receive Resolution Request via Tunnel0*
   packet size: 84
Mar 1 06:03:40.182: NHRP: netid_in = 1, to_us = 0*
Mar 1 06:03:40.182: NHRP: No need to delay processing of resolution*
   event nbma src:209.168.202.225 nbma dst:209.168.202.131
Mar 1 06:03:40.182: NHRP: nhrp_rtlookup yielded Tunnel0*
Mar 1 06:03:40.182: NHRP: netid_out 1, netid_in 1*
Mar 1 06:03:40.182: NHRP: nhrp_cache_lookup_comp returned 0x63DE9498*
.Mar 1 06:03:40.182: NHRP: Encapsulation succeeded*
   Tunnel IP addr 209.168.202.131
,Mar 1 06:03:40.182: NHRP: Send Resolution Reply via Tunnel0*
   packet size: 112
Mar 1 06:03:40.186: src: 192.168.1.1, dst: 192.168.1.2*
Mar 1 06:03:40.186: NHRP: 112 bytes out Tunnel0*
Mar 1 06:03:40.186: NHRP: Forwarding packet within same fabric*
   Tunnel0 -> Tunnel0
,Mar 1 06:03:42.010: NHRP: Receive Resolution Request via Tunnel0*
   packet size: 84
Mar 1 06:03:42.010: NHRP: netid_in = 1, to_us = 0*
Mar 1 06:03:42.010: NHRP: No need to delay processing of resolution*
   event nbma src:209.168.202.225 nbma dst:209.168.202.130
```

تصحيح أخطاء مفاوضات ISAKMP و IPSec

يعرض إخراج تصحيح الأخطاء التالي تفاوض ISAKMP و IPSec. تم التقاط تصحيح الأخطاء من المحطتين sv9-4 و sv9-3.

```
sv9-4#ping 2.2.2.2

.Type escape sequence to abort
:Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms
sv9-4#
Mar 1 02:25:37.107: ISAKMP (0:0): received packet from 209.168.202.131*
   dport 500 sport 500 Global (N) NEW SA
Mar 1 02:25:37.107: ISAKMP: local port 500, remote port 500*
Mar 1 02:25:37.107: ISAKMP: insert sa successfully sa = 63B38288*
,Mar 1 02:25:37.107: ISAKMP (0:12): Input = IKE_MESG_FROM_PEER*
   IKE_MM_EXCH
Mar 1 02:25:37.107: ISAKMP (0:12): Old State = IKE_READY*
   New State = IKE_R_MM1

.Mar 1 02:25:37.107: ISAKMP (0:12): processing SA payload*
   message ID = 0
Mar 1 02:25:37.107: ISAKMP (0:12): processing vendor id payload*
Mar 1 02:25:37.107: ISAKMP (0:12): vendor ID seems Unity/DPD but*
   major 157 mismatch
Mar 1 02:25:37.107: ISAKMP (0:12): vendor ID is NAT-T v3*
Mar 1 02:25:37.107: ISAKMP (0:12): processing vendor id payload*
Mar 1 02:25:37.107: ISAKMP (0:12): vendor ID seems Unity/DPD but*
```

```
major 123 mismatch
Mar 1 02:25:37.107: ISAKMP (0:12): vendor ID is NAT-T v2*
Mar 1 02:25:37.107: ISAKMP: Looking for a matching key for*
in default : success 209.168.202.131
Mar 1 02:25:37.107: ISAKMP (0:12): found peer pre-shared key*
matching 209.168.202.131
Mar 1 02:25:37.107: ISAKMP (0:12) local preshared key found*
... Mar 1 02:25:37.107: ISAKMP : Scanning profiles for xauth*
Mar 1 02:25:37.107: ISAKMP (0:12): Checking ISAKMP transform 1*
against priority 10 policy
Mar 1 02:25:37.107: ISAKMP: encryption DES-CBC*
Mar 1 02:25:37.107: ISAKMP: hash MD5*
Mar 1 02:25:37.107: ISAKMP: default group 1*
Mar 1 02:25:37.107: ISAKMP: auth pre-share*
Mar 1 02:25:37.107: ISAKMP: life type in seconds*
Mar 1 02:25:37.107: ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80*
.Mar 1 02:25:37.107: ISAKMP (0:12): atts are acceptable*
Next payload is 0
Mar 1 02:25:37.115: ISAKMP (0:12): processing vendor id payload*
Mar 1 02:25:37.115: ISAKMP (0:12): vendor ID seems Unity/DPD but*
major 157 mismatch
Mar 1 02:25:37.115: ISAKMP (0:12): vendor ID is NAT-T v3*
Mar 1 02:25:37.115: ISAKMP (0:12): processing vendor id payload*
Mar 1 02:25:37.115: ISAKMP (0:12): vendor ID seems Unity/DPD but*
major 123 mismatch
Mar 1 02:25:37.115: ISAKMP (0:12): vendor ID is NAT-T v2*
,Mar 1 02:25:37.115: ISAKMP (0:12): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_MAIN_MODE
Mar 1 02:25:37.115: ISAKMP (0:12): Old State = IKE_R_MM1*
New State = IKE_R_MM1

Mar 1 02:25:37.115: ISAKMP (0:12): constructed NAT-T vendor-03 ID*
Mar 1 02:25:37.115: ISAKMP (0:12): sending packet to 209.168.202.131*
my_port 500 peer_port 500 (R) MM_SA_SETUP
,Mar 1 02:25:37.115: ISAKMP (0:12): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_COMPLETE
Mar 1 02:25:37.115: ISAKMP (0:12): Old State = IKE_R_MM1*
New State = IKE_R_MM2

Mar 1 02:25:37.123: ISAKMP (0:12): received packet from 209.168.202.131*
dport 500 sport 500 Global (R) MM_SA_SETUP
,Mar 1 02:25:37.123: ISAKMP (0:12): Input = IKE_MESG_FROM_PEER*
IKE_MM_EXCH
Mar 1 02:25:37.123: ISAKMP (0:12): Old State = IKE_R_MM2*
New State = IKE_R_MM3

.Mar 1 02:25:37.123: ISAKMP (0:12): processing KE payload*
message ID = 0
.Mar 1 02:25:37.131: ISAKMP (0:12): processing NONCE payload*
message ID = 0
Mar 1 02:25:37.131: ISAKMP: Looking for a matching key for*
in default : success 209.168.202.131
Mar 1 02:25:37.131: ISAKMP (0:12): found peer pre-shared key matching*
209.168.202.131
Mar 1 02:25:37.131: ISAKMP: Looking for a matching key for*
in default : success 209.168.202.131
Mar 1 02:25:37.131: ISAKMP (0:12): found peer pre-shared key*
matching 209.168.202.131
Mar 1 02:25:37.135: ISAKMP (0:12): SKEYID state generated*
Mar 1 02:25:37.135: ISAKMP (0:12): processing vendor id payload*
Mar 1 02:25:37.135: ISAKMP (0:12): vendor ID is Unity*
Mar 1 02:25:37.135: ISAKMP (0:12): processing vendor id payload*
Mar 1 02:25:37.135: ISAKMP (0:12): vendor ID is DPD*
Mar 1 02:25:37.135: ISAKMP (0:12): processing vendor id payload*
```

```
!Mar 1 02:25:37.135: ISAKMP (0:12): speaking to another IOS box*
Mar 1 02:25:37.135: ISAKMP:received payload type 17*
Mar 1 02:25:37.135: ISAKMP:received payload type 17*
,Mar 1 02:25:37.135: ISAKMP (0:12): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_MAIN_MODE
Mar 1 02:25:37.135: ISAKMP (0:12): Old State = IKE_R_MM3*
New State = IKE_R_MM3

Mar 1 02:25:37.135: ISAKMP (0:12): sending packet to 209.168.202.131*
my_port 500 peer_port 500 (R) MM_KEY_EXCH
,Mar 1 02:25:37.135: ISAKMP (0:12): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_COMPLETE
Mar 1 02:25:37.135: ISAKMP (0:12): Old State = IKE_R_MM3*
New State = IKE_R_MM4

Mar 1 02:25:37.147: ISAKMP (0:12): received packet from 209.168.202.131*
dport 500 sport 500 Global (R) MM_KEY_EXCH
,Mar 1 02:25:37.151: ISAKMP (0:12): Input = IKE_MESG_FROM_PEER*
IKE_MM_EXCH
Mar 1 02:25:37.151: ISAKMP (0:12): Old State = IKE_R_MM4*
New State = IKE_R_MM5

.Mar 1 02:25:37.151: ISAKMP (0:12): processing ID payload*
message ID = 0
Mar 1 02:25:37.151: ISAKMP (0:12): peer matches *none* of the profiles*
.Mar 1 02:25:37.151: ISAKMP (0:12): processing HASH payload*
message ID = 0
Mar 1 02:25:37.151: ISAKMP (0:12): processing NOTIFY INITIAL_CONTACT*
protocol 1 spi 0, message ID = 0, sa = 63B38288
,Mar 1 02:25:37.151: ISAKMP (0:12): Process initial contact*
bring down existing phase 1 and 2 SA's with local 209.168.202.130
remote 209.168.202.131 remote port 500
Mar 1 02:25:37.151: ISAKMP (0:12): SA has been authenticated with*
209.168.202.131
Mar 1 02:25:37.151: ISAKMP (0:12): peer matches *none* of the profiles*
,Mar 1 02:25:37.151: ISAKMP (0:12): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_MAIN_MODE
Mar 1 02:25:37.151: ISAKMP (0:12): Old State = IKE_R_MM5*
New State = IKE_R_MM5

...Mar 1 02:25:37.151: IPSEC(key_engine): got a queue event*
Mar 1 02:25:37.151: ISAKMP (0:12): SA is doing pre-shared key*
authentication using id type ID_IPV4_ADDR
Mar 1 02:25:37.151: ISAKMP (12): ID payload*
next-payload : 8
type : 1
addr : 209.168.202.130
protocol : 17
port : 500
length : 8
Mar 1 02:25:37.151: ISAKMP (12): Total payload length: 12*
Mar 1 02:25:37.155: ISAKMP (0:12): sending packet to 209.168.202.131*
my_port 500 peer_port 500 (R) MM_KEY_EXCH
,Mar 1 02:25:37.155: ISAKMP (0:12): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_COMPLETE
Mar 1 02:25:37.155: ISAKMP (0:12): Old State = IKE_R_MM5*
New State = IKE_P1_COMPLETE

,Mar 1 02:25:37.155: ISAKMP (0:12): Input = IKE_MESG_INTERNAL*
IKE_PHASE1_COMPLETE
Mar 1 02:25:37.155: ISAKMP (0:12): Old State = IKE_P1_COMPLETE*
New State = IKE_P1_COMPLETE

Mar 1 02:25:37.159: ISAKMP (0:12): received packet from 209.168.202.131*
```

```
dport 500 sport 500 Global (R) QM_IDLE
Mar 1 02:25:37.159: ISAKMP: set new node -1682446278 to QM_IDLE*
.Mar 1 02:25:37.159: ISAKMP (0:12): processing HASH payload*
message ID = -1682446278
.Mar 1 02:25:37.159: ISAKMP (0:12): processing SA payload*
message ID = -1682446278
Mar 1 02:25:37.159: ISAKMP (0:12): Checking IPSec proposal 1*
Mar 1 02:25:37.159: ISAKMP: transform 1, ESP_3DES*
:Mar 1 02:25:37.159: ISAKMP: attributes in transform*
Mar 1 02:25:37.159: ISAKMP: encaps is 1*
Mar 1 02:25:37.159: ISAKMP: SA life type in seconds*
Mar 1 02:25:37.159: ISAKMP: SA life duration (basic) of 120*
Mar 1 02:25:37.159: ISAKMP: SA life type in kilobytes*
Mar 1 02:25:37.159: ISAKMP: SA life duration (VPI) of 0x0 0x46 0x50 0x0*
Mar 1 02:25:37.159: ISAKMP: authenticator is HMAC-MD5*
.Mar 1 02:25:37.159: ISAKMP (0:12): atts are acceptable*
,Mar 1 02:25:37.163: IPSEC(validate_proposal_request): proposal part #1*
,key eng. msg.) INBOUND local= 209.168.202.130, remote= 209.168.202.131)
,(local_proxy= 209.168.202.130/255.255.255.255/47/0 (type=1
,(remote_proxy= 209.168.202.131/255.255.255.255/47/0 (type=1
, protocol= ESP, transform= esp-3des esp-md5-hmac
,lifedur= 0s and 0kb
spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x2
,Mar 1 02:25:37.163: IPSEC(kei_proxy): head = Tunnel0-head-0*
= map->ivrf = , kei->ivrf
,Mar 1 02:25:37.163: IPSEC(kei_proxy): head = Tunnel0-head-0*
= map->ivrf = , kei->ivrf
.Mar 1 02:25:37.163: ISAKMP (0:12): processing NONCE payload*
message ID = -1682446278
.Mar 1 02:25:37.163: ISAKMP (0:12): processing ID payload*
message ID = -1682446278
.Mar 1 02:25:37.163: ISAKMP (0:12): processing ID payload*
message ID = -1682446278
Mar 1 02:25:37.163: ISAKMP (0:12): asking for 1 spis from ipsec*
,Mar 1 02:25:37.163: ISAKMP (0:12): Node -1682446278*
Input = IKE_MESG_FROM_PEER, IKE_QM_EXCH
Mar 1 02:25:37.163: ISAKMP (0:12): Old State = IKE_QM_READY*
New State = IKE_QM_SPI_STARVE
...Mar 1 02:25:37.163: IPSEC(key_engine): got a queue event*
Mar 1 02:25:37.163: IPSEC(spi_response): getting spi 3935077313*
for SA from 209.168.202.130 to 209.168.202.131 for prot 3
(Mar 1 02:25:37.163: ISAKMP: received ke message (2/1*
Mar 1 02:25:37.415: ISAKMP (0:12): sending packet to 209.168.202.131*
my_port 500 peer_port 500 (R) QM_IDLE
,Mar 1 02:25:37.415: ISAKMP (0:12): Node -1682446278*
Input = IKE_MESG_FROM_IPSEC, IKE_SPI_REPLY
Mar 1 02:25:37.415: ISAKMP (0:12): Old State = IKE_QM_SPI_STARVE*
New State = IKE_QM_R_QM2
Mar 1 02:25:37.427: ISAKMP (0:12): received packet from*
dport 500 sport 500 Global (R) QM_IDLE 209.168.202.131
Mar 1 02:25:37.439: ISAKMP (0:12): Creating IPSec SAs*
Mar 1 02:25:37.439: inbound SA from 209.168.202.131 to*
f/i) 0/ 0) 209.168.202.130
(proxy 209.168.202.131 to 209.168.202.130)
Mar 1 02:25:37.439: has spi 0xEA8C83C1 and conn_id 5361 and flags 2*
Mar 1 02:25:37.439: lifetime of 120 seconds*
Mar 1 02:25:37.439: lifetime of 4608000 kilobytes*
Mar 1 02:25:37.439: has client flags 0x0*
Mar 1 02:25:37.439: outbound SA from 209.168.202.130 to*
(f/i) 0/ 0 (proxy 209.168.202.130 to 209.168.202.131) 209.168.202.131
Mar 1 02:25:37.439: has spi 1849847934 and conn_id 5362 and flags A*
Mar 1 02:25:37.439: lifetime of 120 seconds*
Mar 1 02:25:37.439: lifetime of 4608000 kilobytes*
Mar 1 02:25:37.439: has client flags 0x0*
```

```
      Mar 1 02:25:37.439: ISAKMP (0:12): deleting node -1682446278 error*
                                "(FALSE reason "quick mode done (await
                    ,Mar 1 02:25:37.439: ISAKMP (0:12): Node -1682446278*
                               Input = IKE_MESG_FROM_PEER, IKE_QM_EXCH
             Mar 1 02:25:37.439: ISAKMP (0:12): Old State = IKE_QM_R_QM2*
                                    New State = IKE_QM_PHASE2_COMPLETE
             ...Mar 1 02:25:37.439: IPSEC(key_engine): got a queue event*
                            , :(Mar 1 02:25:37.439: IPSEC(initialize_sas*
 ,key eng. msg.) INBOUND local= 209.168.202.130, remote= 209.168.202.131)
                      ,(local_proxy= 209.168.202.130/0.0.0.0/47/0 (type=1
                     ,(remote_proxy= 209.168.202.131/0.0.0.0/47/0 (type=1
                        , protocol= ESP, transform= esp-3des esp-md5-hmac
                                              ,lifedur= 120s and 4608000kb
       spi= 0xEA8C83C1(3935077313), conn_id= 5361, keysize= 0, flags= 0x2
                            , :(Mar 1 02:25:37.439: IPSEC(initialize_sas*
,key eng. msg.) OUTBOUND local= 209.168.202.130, remote= 209.168.202.131)
                      ,(local_proxy= 209.168.202.130/0.0.0.0/47/0 (type=1
                     ,(remote_proxy= 209.168.202.131/0.0.0.0/47/0 (type=1
                        , protocol= ESP, transform= esp-3des esp-md5-hmac
                                              ,lifedur= 120s and 4608000kb
       spi= 0x6E42707E(1849847934), conn_id= 5362, keysize= 0, flags= 0xA
            ,Mar 1 02:25:37.439: IPSEC(kei_proxy): head = Tunnel0-head-0*
                                              = map->ivrf = , kei->ivrf
            ,Mar 1 02:25:37.439: IPSEC(kei_proxy): head = Tunnel0-head-0*
                                              = map->ivrf = , kei->ivrf
              ,Mar 1 02:25:37.439: IPSEC(add mtree): src 209.168.202.130*
                                     dest 209.168.202.131, dest_port 0

                       ,Mar 1 02:25:37.439: IPSEC(create_sa): sa created*
                              ,sa) sa_dest= 209.168.202.130, sa_prot= 50)
                                          ,(sa_spi= 0xEA8C83C1(3935077313
                       sa_trans= esp-3des esp-md5-hmac , sa_conn_id= 5361
                       ,Mar 1 02:25:37.439: IPSEC(create_sa): sa created*
                              ,sa) sa_dest= 209.168.202.131, sa_prot= 50)
                                          ,(sa_spi= 0x6E42707E(1849847934
                       sa_trans= esp-3des esp-md5-hmac , sa_conn_id= 5362
                                                                    sv9-4#
               Mar 1 02:25:55.183: ISAKMP (0:10): purging node 180238748*
             Mar 1 02:25:55.323: ISAKMP (0:10): purging node -1355110639*
                                                                    sv9-4#

                                                                    sv9-3#

                              (ISAKMP: received ke message (1/1 :05:50:48
                     (ISAKMP (0:0): SA request profile is (NULL :05:50:48
                        ISAKMP: local port 500, remote port 500 :05:50:48
                              ISAKMP: set new node 0 to QM_IDLE :05:50:48
                   ISAKMP: insert sa successfully sa = 62DB93D0 :05:50:48
.ISAKMP (0:26): Can not start Aggressive mode, trying Main mode :05:50:48
         ISAKMP: Looking for a matching key for 209.168.202.130 :05:50:48
                                                   in default : success
                       ISAKMP (0:26): found peer pre-shared key :05:50:48
                                               matching 209.168.202.130
                  ISAKMP (0:26): constructed NAT-T vendor-03 ID :05:50:48
                  ISAKMP (0:26): constructed NAT-T vendor-02 ID :05:50:48
      ISAKMP (0:26): Input = IKE_MESG_FROM_IPSEC, IKE_SA_REQ_MM :05:50:48
     ISAKMP (0:26): Old State = IKE_READY New State = IKE_I_MM1 :05:50:48

                    ISAKMP (0:26): beginning Main Mode exchange :05:50:48
   ISAKMP (0:26): sending packet to 209.168.202.130 my_port 500 :05:50:48
                                         peer_port 500 (I) MM_NO_STATE
  ISAKMP (0:26): received packet from 209.168.202.130 dport 500 :05:50:48
                                      sport 500 Global (I) MM_NO_STATE
         ISAKMP (0:26): Input = IKE_MESG_FROM_PEER, IKE_MM_EXCH :05:50:48
```

```
    ISAKMP (0:26): Old State = IKE_I_MM1 New State = IKE_I_MM2 :05:50:48

          ISAKMP (0:26): processing SA payload. message ID = 0 :05:50:48
                   ISAKMP (0:26): processing vendor id payload :05:50:48
                      ISAKMP (0:26): vendor ID seems Unity/DPD :05:50:48
                                               but major 157 mismatch
                          ISAKMP (0:26): vendor ID is NAT-T v3 :05:50:48
        ISAKMP: Looking for a matching key for 209.168.202.130 :05:50:48
                                                 in default : success
                      ISAKMP (0:26): found peer pre-shared key :05:50:48
                                             matching 209.168.202.130
                       ISAKMP (0:26) local preshared key found :05:50:48
                      ... ISAKMP : Scanning profiles for xauth :05:50:48
            ISAKMP (0:26): Checking ISAKMP transform 1 against :05:50:48
                                                   priority 10 policy
                                    ISAKMP: encryption DES-CBC :05:50:48
                                              ISAKMP: hash MD5 :05:50:48
                                       ISAKMP: default group 1 :05:50:48
                                        ISAKMP: auth pre-share :05:50:48
                                  ISAKMP: life type in seconds :05:50:48
              ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80 :05:50:48
         ISAKMP (0:26): atts are acceptable. Next payload is 0 :05:50:48
                   ISAKMP (0:26): processing vendor id payload :05:50:48
                      ISAKMP (0:26): vendor ID seems Unity/DPD :05:50:48
                                               but major 157 mismatch
                          ISAKMP (0:26): vendor ID is NAT-T v3 :05:50:48
                     ,ISAKMP (0:26): Input = IKE_MESG_INTERNAL :05:50:48
                                                IKE_PROCESS_MAIN_MODE
                          ISAKMP (0:26): Old State = IKE_I_MM2 :05:50:48
                                                New State = IKE_I_MM2

  ISAKMP (0:26): sending packet to 209.168.202.130 my_port 500 :05:50:48
                                        peer_port 500 (I) MM_SA_SETUP
ISAKMP (0:26): Input = IKE_MESG_INTERNAL, IKE_PROCESS_COMPLETE :05:50:48
    ISAKMP (0:26): Old State = IKE_I_MM2 New State = IKE_I_MM3 :05:50:48

 ISAKMP (0:26): received packet from 209.168.202.130 dport 500 :05:50:48
                                     sport 500 Global (I) MM_SA_SETUP
        ISAKMP (0:26): Input = IKE_MESG_FROM_PEER, IKE_MM_EXCH :05:50:48
    ISAKMP (0:26): Old State = IKE_I_MM3 New State = IKE_I_MM4 :05:50:48

          ISAKMP (0:26): processing KE payload. message ID = 0 :05:50:48
       ISAKMP (0:26): processing NONCE payload. message ID = 0 :05:50:48
        ISAKMP: Looking for a matching key for 209.168.202.130 :05:50:48
                                                 in default : success
                      ISAKMP (0:26): found peer pre-shared key :05:50:48
                                             matching 209.168.202.130
        ISAKMP: Looking for a matching key for 209.168.202.130 :05:50:48
                                                 in default : success
                      ISAKMP (0:26): found peer pre-shared key :05:50:48
                                             matching 209.168.202.130
                         ISAKMP (0:26): SKEYID state generated :05:50:48
                   ISAKMP (0:26): processing vendor id payload :05:50:48
                             ISAKMP (0:26): vendor ID is Unity :05:50:48
                   ISAKMP (0:26): processing vendor id payload :05:50:48
                               ISAKMP (0:26): vendor ID is DPD :05:50:48
                   ISAKMP (0:26): processing vendor id payload :05:50:48
                   !ISAKMP (0:26): speaking to another IOS box :05:50:48
                               ISAKMP:received payload type 17 :05:50:48
                               ISAKMP:received payload type 17 :05:50:48
                     ,ISAKMP (0:26): Input = IKE_MESG_INTERNAL :05:50:48
                                                IKE_PROCESS_MAIN_MODE
                          ISAKMP (0:26): Old State = IKE_I_MM4 :05:50:48
                                                New State = IKE_I_MM4
```

```
                           ISAKMP (0:26): Send initial contact :05:50:48
      ISAKMP (0:26): SA is doing pre-shared key authentication :05:50:48
                                           using id type ID_IPV4_ADDR
                                       ISAKMP (26): ID payload :05:50:48
                                                        next-payload : 8
                                                                type : 1
                                                  addr : 209.168.202.131
                                                           protocol : 17
                                                              port : 500
                                                              length : 8
                         ISAKMP (26): Total payload length: 12 :05:50:48
  ISAKMP (0:26): sending packet to 209.168.202.130 my_port 500 :05:50:48
                                        peer_port 500 (I) MM_KEY_EXCH
                     ,ISAKMP (0:26): Input = IKE_MESG_INTERNAL :05:50:48
                                                 IKE_PROCESS_COMPLETE
                          ISAKMP (0:26): Old State = IKE_I_MM4 :05:50:48
                                                  New State = IKE_I_MM5

ISAKMP (0:26): received packet from 209.168.202.130 dport 500 :05:50:48
                                     sport 500 Global (I) MM_KEY_EXCH
                    ,ISAKMP (0:26): Input = IKE_MESG_FROM_PEER :05:50:48
                                                          IKE_MM_EXCH
                          ISAKMP (0:26): Old State = IKE_I_MM5 :05:50:48
                                                  New State = IKE_I_MM6

          ISAKMP (0:26): processing ID payload. message ID = 0 :05:50:48
        ISAKMP (0:26): processing HASH payload. message ID = 0 :05:50:48
 ISAKMP (0:26): SA has been authenticated with 209.168.202.130 :05:50:48
            ISAKMP (0:26): peer matches *none* of the profiles :05:50:48
                     ,ISAKMP (0:26): Input = IKE_MESG_INTERNAL :05:50:48
                                                IKE_PROCESS_MAIN_MODE
                          ISAKMP (0:26): Old State = IKE_I_MM6 :05:50:48
                                                  New State = IKE_I_MM6

                     ,ISAKMP (0:26): Input = IKE_MESG_INTERNAL :05:50:48
                                                 IKE_PROCESS_COMPLETE
                          ISAKMP (0:26): Old State = IKE_I_MM6 :05:50:48
                                          New State = IKE_P1_COMPLETE

                 ,ISAKMP (0:26): beginning Quick Mode exchange :05:50:48
                                                  M-ID of -1682446278
  ISAKMP (0:26): sending packet to 209.168.202.130 my_port 500 :05:50:48
                                            peer_port 500 (I) QM_IDLE
   ,ISAKMP (0:26): Node -1682446278, Input = IKE_MESG_INTERNAL :05:50:48
                                                          IKE_INIT_QM
                       ISAKMP (0:26): Old State = IKE_QM_READY :05:50:48
                                              New State = IKE_QM_I_QM1
                     ,ISAKMP (0:26): Input = IKE_MESG_INTERNAL :05:50:48
                                                  IKE_PHASE1_COMPLETE
                    ISAKMP (0:26): Old State = IKE_P1_COMPLETE :05:50:48
                                          New State = IKE_P1_COMPLETE

ISAKMP (0:26): received packet from 209.168.202.130 dport 500 :05:50:48
                                         sport 500 Global (I) QM_IDLE
                       .ISAKMP (0:26): processing HASH payload :05:50:48
                                             message ID = -1682446278
                         .ISAKMP (0:26): processing SA payload :05:50:48
                                             message ID = -1682446278
                      ISAKMP (0:26): Checking IPSec proposal 1 :05:50:48
                                 ISAKMP: transform 1, ESP_3DES :05:50:48
                              :ISAKMP: attributes in transform :05:50:48
                                           ISAKMP: encaps is 1 :05:50:48
                               ISAKMP: SA life type in seconds :05:50:48
                       ISAKMP: SA life duration (basic) of 120 :05:50:48
                             ISAKMP: SA life type in kilobytes :05:50:48
           ISAKMP: SA life duration (VPI) of 0x0 0x46 0x50 0x0 :05:50:48
                             ISAKMP: authenticator is HMAC-MD5 :05:50:48
                           .ISAKMP (0:26): atts are acceptable :05:50:48
           ,IPSEC(validate_proposal_request): proposal part #1 :05:50:48
                         ,key eng. msg.) INBOUND local= 209.168.202.131)
                                             ,remote= 209.168.202.130
             ,(local_proxy= 209.168.202.131/255.255.255.255/47/0 (type=1
            ,(remote_proxy= 209.168.202.130/255.255.255.255/47/0 (type=1
                       , protocol= ESP, transform= esp-3des esp-md5-hmac
                                                    ,lifedur= 0s and 0kb
                         spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x2
                      ,IPSEC(kei_proxy): head = Tunnel0-head-0 :05:50:48
                                            = map->ivrf = , kei->ivrf
                      ,IPSEC(kei_proxy): head = Tunnel0-head-0 :05:50:48
                                            = map->ivrf = , kei->ivrf
                      .ISAKMP (0:26): processing NONCE payload :05:50:48
                                             message ID = -1682446278
                         .ISAKMP (0:26): processing ID payload :05:50:48
                                             message ID = -1682446278
                         .ISAKMP (0:26): processing ID payload :05:50:48
                                             message ID = -1682446278
                             ISAKMP (0:26): Creating IPSec SAs :05:50:48
                            inbound SA from 209.168.202.130 to :05:50:48
                                           f/i) 0/ 0) 209.168.202.131
                              (proxy 209.168.202.130 to 209.168.202.131)
               has spi 0x6E42707E and conn_id 5547 and flags 2 :05:50:48
                                       lifetime of 120 seconds :05:50:48
                                 lifetime of 4608000 kilobytes :05:50:48
                                          has client flags 0x0 :05:50:48
           outbound SA from 209.168.202.131 to 209.168.202.130 :05:50:48
                (f/i) 0/ 0 (proxy 209.168.202.131 to 209.168.202.130)
               has spi -359889983 and conn_id 5548 and flags A :05:50:48
                                       lifetime of 120 seconds :05:50:48
                                 lifetime of 4608000 kilobytes :05:50:48
                                          has client flags 0x0 :05:50:48
                       ...IPSEC(key_engine): got a queue event :05:50:48
                                      , :(IPSEC(initialize_sas :05:50:48
                         ,key eng. msg.) INBOUND local= 209.168.202.131)
                                             ,remote= 209.168.202.130
                     ,(local_proxy= 209.168.202.131/0.0.0.0/47/0 (type=1
                    ,(remote_proxy= 209.168.202.130/0.0.0.0/47/0 (type=1
                       , protocol= ESP, transform= esp-3des esp-md5-hmac
                                            ,lifedur= 120s and 4608000kb
      spi= 0x6E42707E(1849847934), conn_id= 5547, keysize= 0, flags= 0x2
                                      , :(IPSEC(initialize_sas :05:50:48
                        ,key eng. msg.) OUTBOUND local= 209.168.202.131)
                                             ,remote= 209.168.202.130
                     ,(local_proxy= 209.168.202.131/0.0.0.0/47/0 (type=1
                    ,(remote_proxy= 209.168.202.130/0.0.0.0/47/0 (type=1
                       , protocol= ESP, transform= esp-3des esp-md5-hmac
                                            ,lifedur= 120s and 4608000kb
      spi= 0xEA8C83C1(3935077313), conn_id= 5548, keysize= 0, flags= 0xA
                      ,IPSEC(kei_proxy): head = Tunnel0-head-0 :05:50:48
                                            = map->ivrf = , kei->ivrf
                      ,IPSEC(kei_proxy): head = Tunnel0-head-0 :05:50:48
                                            = map->ivrf = , kei->ivrf
  ,IPSEC(add mtree): src 209.168.202.131, dest 209.168.202.130 :05:50:48
                                                          dest_port 0

                                 ,IPSEC(create_sa): sa created :05:50:48
                             ,sa) sa_dest= 209.168.202.131, sa_prot= 50)
                                         ,(sa_spi= 0x6E42707E(1849847934
                        sa_trans= esp-3des esp-md5-hmac , sa_conn_id= 5547
                                   ,IPSEC(create_sa): sa created :05:50:48
                               ,sa) sa_dest= 209.168.202.130, sa_prot= 50)
                                           ,(sa_spi= 0xEA8C83C1(3935077313
                        sa_trans= esp-3des esp-md5-hmac , sa_conn_id= 5548
    ISAKMP (0:26): sending packet to 209.168.202.130 my_port 500 :05:50:48
                                              peer_port 500 (I) QM_IDLE
  "" ISAKMP (0:26): deleting node -1682446278 error FALSE reason :05:50:48
    ,ISAKMP (0:26): Node -1682446278, Input = IKE_MESG_FROM_PEER :05:50:48
                                                            IKE_QM_EXCH
                         ISAKMP (0:26): Old State = IKE_QM_I_QM1 :05:50:48
                                     New State = IKE_QM_PHASE2_COMPLETE
                           ISAKMP (0:21): purging node 334570133 :05:50:49
                                                                    sv9-3#
```

معلومات ذات صلة

- مفاوضة IPSec/بروتوكولات IKE
- الدعم الفني - Cisco Systems

حول هذه الترجمة

ترجمت Cisco هذا المستند باستخدام مجموعة من التقنيات الآلية والبشرية لتقديم محتوى دعم للمستخدمين في جميع أنحاء العالم بلغتهم الخاصة. يُرجى ملاحظة أن أفضل ترجمة آلية لن تكون دقيقة كما هو الحال مع الترجمة الاحترافية التي يقدمها مترجم محترف. تخلي Cisco Systems مسئوليتها عن دقة هذه الترجمات وتُوصي بالرجوع دائمًا إلى المستند الإنجليزي الأصلي (الرابط متوفر).